

Math Task: Linear Equations

**Parts of this project are taken from The Monterey Institute.*

Objective: To write and display linear equations that will help the Community Council make informed decisions about the upcoming Winter Dance.

Problems: The Community Council has to make several decisions about the Winter Dance:

- The council must choose a DJ, a food vendor, a chair rental, photo booth, decorations, and chaperones.

Your Task: Use the information from each company to write and graph linear equations that will help the Community Council make the best decisions for the Winter Dance. **Make a specific, convincing recommendation based on the algebraic and graphic evidence.**

Grades: You will have three grades: 10 point participation grade, 20 point Visual Representation (quiz grade), 20 point written response quiz grade.

Names: _____

DJ Problem: The first decision to be made for the party is selecting a DJ.

Tunes, Inc. will provide a DJ for \$125 per hour with a set-up fee of \$325. Music Innovations has offered a price of \$165 per hour with no set-up fee. Which DJ should be used?

1. What is this task about?

2. What is this task asking you to do?

3. How are you going to solve this problem both algebraically and graphically?

Names: _____

DJ Follow-up Questions:

4. If the Community Council has a budget of \$825 for the DJ, how many hours could be afforded if Tunes, Inc. is chosen? Show your work.

5. How many hours could be afforded if they choose Music Innovations? Show your work.

6. Which DJ should be used? Justify your answer using your algebraic equations and graphs. (This will be the guide for your visual representation).

Names: _____

Food Problem: There are two food vendors to consider.

Event Solutions charges a one-time fee of \$300 for table rentals and then \$5 per person for food and drink. Parties Made Easy charges \$8 per person for an all-inclusive event. The fee per person includes food and drink, as well as tables.

1. What is this task about?

2. What is this task asking you to do?

3. How are you going to solve this problem both algebraically and graphically?

Names: _____

Food Follow-up Questions

4. If the Community Council has a budget of \$2,000 for food, drink and tables, how many people could attend if Event Solutions is used? Show your work.

5. If the Community Council has a budget of \$2,000 for food, drink and tables, how many people could attend if Parties Made Easy is used? Show your work.

6. Which food vendor should be used? Justify your answer using your algebraic equations and graphs. (This will be your guide for your visual representation).

Names: _____

Chair Problem: There are two companies in the D.C. area that will rent their chairs to schools. Chairs Emporium rents chairs for \$10 each, unlimited time. Joanne's Seats has a deal where we pay a set fee of \$100 and then \$2 for every chair that we rent.

1. What is this task about?

2. What is this task asking you to do?

3. How are you going to solve this problem both algebraically and graphically?

4. Use algebra to set up an equation in slope-intercept form for the total cost, T , of using Chairs Emporium, based on the number of chairs, c .

5. Use algebra to set up an equation in slope-intercept form for the total cost, T , of using Joanne's seats, based on the number of chairs, c .

6. Graph both equations on the same first quadrant of the coordinate plane. Be sure to label your axes.

Names: _____

Chair Follow-up Questions

4. If the Community Council has a budget of \$500 for the chair rentals, how many chairs could they get if Chairs Emporium is used? Show your work.

5. If the Community Council has a budget of \$500 for the chair rentals, how many chairs could they Joanne's Seats is used? Show your work.

6. Which party rental company should be used? Justify your answer using your algebraic equations and graphs.

Names: _____

Chaperones Problem: This year, the 7th and 8th grade teachers have decided that they should be paid to be a chaperone. The 7th grade team wants a \$75 fee just for asking to chaperone a dance, plus \$20 per hour they are there. The 8th grade team would like \$15 for each hour they are there (no fee just for asking).

1. What is this task about?

2. What is this task asking you to do?

3. How are you going to solve this problem both algebraically and graphically?

4. Use algebra to set up an equation in slope-intercept form for the total cost, C , of using 7th grade chaperones, based on the number of hours, h .

5. Use algebra to set up an equation in slope-intercept form for the total cost, C , of using 8th grade chaperones, based on the number of hours, h .

6. Graph both equations on the same first quadrant of the coordinate plane. Be sure to label your axes.

Names:

Chaperones Follow-up Questions:

4. If the Community Council has a budget of \$100 for the chaperones, how many hours could the 7th grade team chaperone the dance? Show your work.

5. If the Community Council has a budget of \$100 for the chaperones, how many hours could the 8th grade team chaperone the dance? Show your work.

6. Which party rental company should be used? Justify your answer using your algebraic equations and graphs.

Names: _____

Photo Booth Problem: The Community Council would like to use a party rental company to rent a photo booth and snowball machine for the dance. Acme Party Rental has offered a price of \$200 per hour with a delivery fee of \$250 and a set-up fee of \$250. Rentals-R-Us has offered a price of \$350 per hour with free delivery and a \$100 set up fee.

1. What is this task about?

2. What is this task asking you to do?

3. How are you going to solve this problem both algebraically and graphically?

4. Use algebra to set up an equation in slope-intercept form for the total cost, C , of using Acme Party Rentals, based on the number of hours, h .

5. Use algebra to set up an equation in slope-intercept form for the total cost, C , of using Rentals-R-Us, based on the number of hours, h .

6. Graph both equations on the same first quadrant of the coordinate plane. Be sure to label your axes.

Names:

Photo Booth Follow-up Questions

4. If the Community Council has a budget of \$1,500 for the rentals, how many hours could the equipment be rented if Acme Party Rentals is used? Show your work.

5. If the Community Council has a budget of \$1,500 for the rentals, how many hours could the equipment be rented if Rentals-R-Us is used? Show your work.

6. Which party rental company should be used? Justify your answer using your algebraic equations and graphs.

Name: _____

Math Task Rubric

	Unsatisfactory (0-1)	Satisfactory (2-3)	Outstanding (4-5)	Score
Algebraic Equations	Equations are not present or barely present.	Equations are written, but are incomplete and/or inaccurate.	All equations are written in correct slope-intercept form and are accurate.	
Graphs	Graphs are not present or barely present.	Graphs are present, but are incomplete and/or inaccurate.	Graphs are present, complete, accurate and neat.	
Recommendations	Recommendations are not provided or are only minimally provided.	Recommendations are given with some justifications and are somewhat or mostly convincing.	Recommendations are provided with excellent algebraic and graphic justifications and are extremely convincing.	
Visual Representation	Visual Representation is unreadable, and/or incomplete.	Visual Representation is mostly complete and neat/organized.	Visual Representation is complete with algebraic and graphic evidence of the solution, plus neat and organized.	
Total				/20

Rubric for Math Responses

Remember:

- Beginning, middle, and end format
- Statement -> evidence (why?)
- Retell the situation and what you did to solve the problem
- Use correct grammar, punctuation, and spelling

	Excellent	Very Good	Below Average	Needs Improvement
The answer is included	2	1.5	1	0
You restated/retold the situation	3	2	1	0
You followed a beginning, middle, and end format	5	4	3	2 (or lower)
Your reasoning is explained and is understandable	5	4	3	2 (or lower)
You used proper grammar, spelling, and mechanics	2	1.5	1	0
Your explanation makes sense and accurately uses algebraic terms	3	2	1	0

Total: _____
20

